

REMARKS

Claims 61-100 are all the claims pending in the application.

New Claims

Claims 61-71: New claims 61 to 71 refer to a method for the preparation of microparticles from a one-phase system by evaporation, and are supported by original claims 24-28 and 55-60.

Claims 72-98: New claims 72-98 are directed to a composition for the production of microparticles, and are supported by original claims 2-22, 31, 32 and 44. Claim 89 is additionally supported at page 8, line 25; page 12, lines 20-30 and page 13, lines 29-30.

Claims 99 and 100: Claims 99 and 100 concern the microparticles, and are supported by original claims 30 and 31.

The composition and the microparticles are specified *inter alia* by the percentage content of the polymer compounds and the biological material.

New Main Claims

The basic idea of the invention pertains to a method for the preparation of microparticles from a liquid one-phase system by initializing the phase separation by evaporation of water. Thus, the formation of a dispersion (*i.e.* the microparticles) is induced by the evaporation of water only, and no conventional phase separation method or other emulsification means like stirring or vortexing is needed.

Novelty (method claims)

The Examiner rejected claims 1-4 under 35 U.S.C. § 102(b) as anticipated by any of **D1** Woiszvillo (US Patent No. 5,848,884), **D2** OctoPlus (EP 0 842 657 A1), or **D3** Magnus (EP 0 213 303 A2). However, none of these cited documents anticipates the new claim 1.

D1 describes a method for the formation of microparticles by mixing macro-molecules in solution or a liquid phase with a polymer or mixture of polymers in solution or liquid phase in the presence of an energy source (ref. **D1** col. 7, lines 5 to 9). The energy source can either be heat, radiation, or ionization, alone or in combination with sonication, vortexing, mixing or stirring for a predetermined length of time (ref. **D1** col. 7, lines 33-37). Moreover, **D1** refers to a number of different techniques routinely used to provide microparticles from synthetic polymers, natural polymers, proteins and polysaccharides, including phase separation, solvent evaporation, emulsification, and spray drying (ref. **D1** col. 1, lines 40 to 44). Thus, solvent evaporation is mentioned in a general broad context without the specification of its functional advantages. Since one skilled in the art knows from all the examples of **D1** that the phase separation is initiated by vortexing or stirring, he understands that according to **D1** the evaporation has a mere supportive function to concentrate or solidify the microparticles once they are formed. The evaporation thus is not disclosed as an instrument to form a dispersed and continuous phase.

In contrast to this, the method according to the invention is based on the usage of evaporation in order to achieve a dispersion (and thus microparticles).

Therefore, the subject matter of amended claims 1 to 11 is novel over **D1**.

Document D2 relates to an aqueous two-phase system with crosslinkable polymers, wherein a crosslinkable polymer phase is emulsified in the other aqueous polymer phase to form microspheres.

Thus, the formation of microparticles is based on the formation of crosslinks between polymers. Thus, the present invention is novel over D2.

Document D3 describes a method for producing polymer particles from a two-phase emulsion system. The microparticles are solidified by input of energy to the two-phase system via evaporation.

Therefore, evaporation as used in D3 is applied as a concentration step for the solidification of the particles and not for the formation of microparticles as described in the present invention. The subject-matter of the present invention is therefore novel over D3.

Inventive Step (method claims)

Furthermore, the Examiner asserted that it is well known by a person skilled in the art that aqueous solutions of two incompatible polymers will spontaneously separate into a dispersed and continuous phase when a critical polymer concentration has been reached, due to evaporation of water.

All cited documents describe other techniques than evaporation to achieve a dispersion, which comprises microparticles as the dispersed phase. The most common technique known is stirring of the compounds combined with stirring of the mixture (ref. D1, example 14, col. 24, lines 27 to 30; D2, example 1, p.5, lines 34 to 38; D3, example 2, col. 11, lines 35-42). In none of the cited documents is evaporation the instrument of choice.

This clearly indicates that one skilled in the art assumes that prior to a concentration step a physical or chemical treatment of the composition is required in order to enable the formation of a dispersed and a continuous phase. Thus, the invention is not obvious over the cited references.

Novelty (composition)

The composition according to new claims 72 to 98 is novel over D1, D2 and D3.

Document D1 discloses a two-phase aqueous system with microparticles, wherein the microparticles comprise macromolecules and a polymer. The microparticles are composed of polymer and macromolecules, wherein at least 40% and less than 100% of the final weight of each microparticle is composed of macromolecules. The concentration of the polymer is less than 30% by weight of the total microparticle weight (ref. D1 claim 1 and col. 3, lines 29-33).

Instead, the composition according to the invention leads to microparticles with at least 75% of said polymer compounds and 25% or less of said biological molecules.

Also D2 and D3 contain no information about the percentages of the polymer in the microspheres. Thus, they do not disclose the composition as claimed.

Inventive Step (composition)

The Examiner asserted that two-phase aqueous polymer systems with microparticles in the dispersed phase are well known by a person skilled in the art.

None of the given examples in D1, D2 or D3 suggests to provide a composition of microparticles with a contrary percentage proportion of polymers and macromolecules. It is

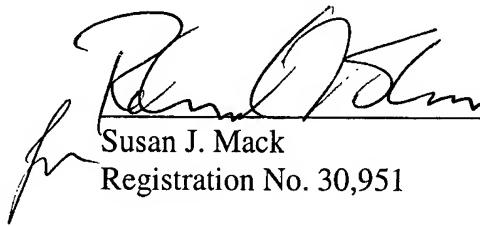
Amendment Under 37 C.F.R. § 1.111
U.S. Serial No. 10/018,773

therefore not obvious for a person skilled in the art to develop the claimed mixtures for the formation of microparticles of the present invention.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



22775
Susan J. Mack
Registration No. 30,951

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: September 19, 2003

NOTE: The Federal Government closed Thursday, September 18 and Friday, September 19, 2003, due to Hurricane Isabel. Deposited with the PTO on September 22, 2003.